



Marine Safety Consultants, Inc.

Marine Surveyors and Consultants

Fairhaven, Massachusetts Since 1980

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Fleet Condition Useful Life, Functional Obsolescence Report

ULFO

April 2022

Submitted to:

**Woods Hole, Martha's Vineyard & Nantucket
Steamship Authority**



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1 INTRODUCTION

Passenger vessels sailing the salt waters of Nantucket Bay and Vineyard Sound have a time-tested limited life expectancy. Historically documented factors that affect a vessel's life expectancy are, but not limited to:

- (1) Vessel's age.
- (2) Construction materials and method.
- (3) Scantlings, including the size and thickness of constructions materials.
- (4) Machinery
- (5) Area of service
- (6) Sustainability of consistent and age escalation maintenance costs and,
- (7) Regulatory constraints,

The average lifespan of an ocean commercial vessel averages 25-30 years. Beyond this, vessel maintenance costs escalate to the point where the cost to operate may outweigh operational commercial advantages. At some point of extended usage, the risks and costs may outweigh vessels useful life.

Never ending regulations are frequently promulgated by local, federal, and international organizations all of which have an impact on vessel operations, documentation, certification, and useful life. Changing technology, repair, maintenance costs and patron expectation, all factor into determining a vessels functional obsolescence.

Increasing a vessel longevity rests solely with vessel management's ability to support operations with an adequate maintenance budget, repair supplies and engineering technical proficiency.

The scope of our vessel surveys was established by SSA management in order to determine the approximate useful life and functional obsolescence of the Steamship's fleet of vessels within their present operation system.

As a major component to this report, we attended each vessel, conducting vessel surveys, interviewed crew members and Steamship management personnel. We have researched present and pending regulations pertaining to the passenger and freight hauling industry.

Logistical obstacles of vessels being crewed while operating, dry docked or unmanned at the time of surveys curbed our ability to conduct in-depth inspections. However, the level of cooperation from vessel crew members and management personnel proved effective, enabling the surveyor to have access to the majority of compartments and spaces on all the vessels.

Useful Life for this report is defined as an engineering and operational estimate used for fleet planning purposes, in an estimated number of years remaining in a vessels ability to function in the capacity in which originally designed for. This estimate is adjusted to reflect design and construction particulars, impending market opportunities, projected changes in regulatory requirements, technical, and market factors involved in vessel operation, maintenance and repair.

Functional Obsolescence for this report is defined as when the cost of repairs or replacement parts is higher than the cost of new or when the vessels is no longer able to provide the service for which it was originally designed. This may be due to natural wear and tear or due to intervening acts such as regulatory or technological advances. Equipment may become obsolete when parts are no longer available for repair or the need to rely on availability of “vintage parts.”

“Obsolescence appears when changes in requirements or anticipations considering the utility of the vessel are registered. In most cases, vessels continue to function but at levels below standards. One of the defining characteristics of a ship is the long service life, of many decades. There is a large number of obstacles faced, trying to predict vessels design life including uncertainties on climate and variables influencing deterioration, our limited knowledge of mechanisms of ships’ degradation, lack of sufficient information and inherent complexities of the problem. In mathematical terms, vessels performance may be represented in equation”. (IOP- Institute of Physics Conference Paper-Maritime vessel obsolescence, life cycle cost and design service life 2015)

A key element in prolonging the useful life of any vessel is the effective cleaning, coating and preservation program which minimizes the corrosive effects of operating in a salt water marine environment.

A company’s ability to maintain its vessels and the cost of doing so is proportionate to a financial line of diminishing return. The cost of maintaining or the cost of a new vessel is dependent upon many factors including, but not limited, to the scope of work a vessel is engaged within, the company’s ability to maintain its own vessels, the increasing cost of maintenance as a vessel gets older through normal wear and tear, and a company’s revenues, which may or may not justify new builds. Adding to the formula is the regulatory environment which also may affect a vessel obsolescence.

Within our report are individual snap shots of each vessel, their general condition, discussing suspect or problem areas found during individual surveys.

From discussions with SSA management, the USCG and research, we illustrate the regulatory environment and technical advances that affect Steamship Authority vessels presently and discuss future regulatory and operational challenges.

2 OBSERVATIONS AND RECOMMENDATIONS

The Steamship Authority (SSA) operates a computerized maintenance management system (CMMS), [REDACTED] designed to be used throughout the fleet for asset management, maintenance management, tracking and record keeping. [REDACTED] is embedded in [REDACTED] the larger software system utilized by the SSA for procurement, expenditures, and payroll processing. The integration allows the fleet additional capabilities such as requisitioning purchase orders for parts and services directly from maintenance requests and viewing available stock to place orders with the SSA’s warehouse and stockroom.

The system appears to be adequate for its intended purpose however, presently under-utilized. As the system becomes better understood by vessel crews, the system's capabilities and implementation of additional programs, CMMS will become be an indispensable asset for overall vessel and shoreside operations.

During our surveys we identified a need for the implementation and transition into the SQMS to be as smooth as possible for all users. As previously mentioned, connectivity plays a vital role in operations. A system that allows users to have confidence that the work/data entered is received effectively and that the workflow loop is closed when completed, will ultimately be successful.

SSA is utilizing a consultant development team to connect the programs together by working with vendors such as the [REDACTED] program and the Marine Learning System (MLS). The consultant, CBIZ also assists with system issues, inexperienced users, etc.

Another key factor for the success of any new program is that users require time and training to become familiar with the process and gain confidence in its use. Data entry while a vessel is underway for a 45-minute trip does not allow concentrated time to perform numerous data inputs for preventative maintenance (PM) issues and maintain a proper watch.

During the surveys we spoke with vessel senior deck and engineering officers as well as some of the crew members. SSA fleet personnel operate under a rotation of 24 hours on and 48 hours off. With the present rotation onboard, engineering staff and vessel crews find it difficult to perform everyday PM's and repairs at a consistent level necessary to operate vessels at peak performance. This fact illustrates the importance of strong and efficient shore-side support for fleet operations.

It was noted in the HMS Comprehensive Review that a need for more training was needed for some of the recently installed components being used aboard SSA vessels. Additional training was found to be needed for vessel crews to SSA policies and/or safety initiatives. With the implementation of a SQMS these lapses should be eliminated, or at the very least minimized. We recommend that all personnel coming from the hiring hall, without benefit of prior knowledge of any of the vessels or SSA policies complete an orientation specific to their job description and the systems within their responsibilities. It is understood that training does occur, however, our observations indicated that orientation training is not formalized in a consistent manner.

As noted in the HMS Review, it recommended adding strategic positions in the engineering department to augment existing positions. Our survey observed there is a concentrated effort to add those additional, qualified professionals to fill the gaps for project management.

Senior SSA vessel management personnel are professionally qualified, dependable, and hard-working, however, observed at times over-extended. It is well understood that being on-call is part of the process in this industry, however being overextended for lengthy periods of time promotes burn out. Although not frequent, the possible loss of established, seasoned professionals may be the result of burn out. With the introduction of a new Director of Marine Operations, as recommended by the HMS Comprehensive Review, there is a noted change to overall vessel performance, preventative maintenance and appearances. A notable observation was the re-installation of the fuel purifiers coupled with a new fuel filtration system. These systems have

proved well worth their cost to install, resulting in enhanced machinery performance and endurance.

The useful life and functional obsolescence of any vessel is subjective and completely dependent upon the level of attention paid by vessel crews, management support team and repair funds afforded to each vessel. SSA's management staff and Fairhaven Maintenance Facility have been providing the high degree of effort needed to preserve the present fleet however, as vessels within the fleet age, focus and effort must increase, stretching workforce and repair budgets.

Within the next 3-5 years public pressure is going to increase for the marine transportation segment, in particular passenger ferries to build or convert vessels to be operated by environmentally friendly propulsion systems. This is a vital component of functional obsolescence.

It is recommended the SSA embrace research to replace 50-year-old technology with advanced hybrid, or environmentally friendly (Green) propulsion systems. There are ferry operators presently operating, designing, building or converting vessels to meet public demand for cleaner, greener and more cost-effective propulsion systems. We recommend that this be an immediate consideration for the SSA.

The average age of the fleet is above 34 years old. As the fleet grows older the port engineers become overtaxed in their attempts to maintain very tight and strict operating schedules with minimal down-time. That said, the trend as observed appears to be working towards stemming the flow of unintended expenditures while at the same time focusing on the SSA's mission.

3 USEFUL LIFE & FUNCTIONAL OBSOLESCENCE SURVEYS

Table 4

VESSEL	YEAR BUILT	YR RE-Built/Half Life Refit	ULFO	COMMENTS
1) M/V EAGLE	1987	Acquired 1987 Midlife 2012 Recent dry-docking 12/31/2020	12-14 years, Considering a major re-fit and probable re-power on or about 2024/25 (35 years old)	A robustly build vessel. Age of some of her machinery, generators require vintage (possibly hard to get) parts. More time and expense necessary to maintain this vessel. Useful life can be extended through a rigorous maintenance program.
2) M/V GAY HEAD	1981	Acquired/converted in 1987 1989 Lengthened and repowered 1999 Widened 2005	3-5 years. (41 years old)	This vessel has persistent steel problems especially with the freight ramp voids. Additional issues are difficult to maintain double bottoms and voids where heavy scale rust was noted. This freight vessel is functionally obsolete due to her age, having to

		Recent dry-docking 07/31/2021		back freight trucks aboard for transport and some of her components. To extend useful life, a rigorous preservation, time consuming and expensive maintenance program is necessary. Which may include a re-power in the near future.
3) M/V GOVERNOR	1954	Acquired 1998 New [REDACTED] main engines installed (2011). Recent dry docking 2021 Recently installed new [REDACTED] generator installed 2018-2019	5-7 years. This vessel has reached her useful life. (68 years old)	Age, sea and draft limitations are affecting functional obsolescence of this vessel. Issues are difficult to maintain voids and deep bottoms, being constantly wet with salt water, original steering gear still in use, deck house is deteriorated at deck level. To extend useful life a rigorous preservation, time consuming and expensive maintenance program is necessary.
4) M/V ISLAND HOME	2007	Acquired 2007 Recent dry-docking 02/25/2022	30 – 33 years Provided she get her mid-life in early 2030's or sooner. (15 years old)	This vessel is at the age where the details are starting to need attention and more focus from management will be needed. This is a well built and thought-out vessel for her trade.
5) M/V IYANOUGH	2006	Significant hull plating replacement & repairs took place, mid-2017. In water repairs took place winter of 2018. Last dry-docking March 2022	22-25 years Provided she gets laid up each winter, jets are pulled and repaired as needed (16 years Old)	This vessel requires tremendous attention and focus from engineering. Recommend continued winter lay-up. Jets are maintenance heavy. Piping issues are constant concern.
6) M/V KATAMA	1982	Acquired 1986 1988 Lengthened and repowered 1998 Widened 2005 Recent dry-docking 08/27/2020	3-5 years (40 years old)	Issues noted are cement ballast tanks, & numerous difficulties to maintain voids, which detract from useful life. Vessel's age, having to back freight trucks aboard for transport and some of her machinery make this vessel obsolete and at or near extent of useful life. To extend useful life a rigorous preservation, time consuming and expensive maintenance program is

				necessary. This may include a re-power in near future.
7) M/V SANKATY	1981	<p>Acquired 1994 Last dry docked in 2017</p> <p>Lengthened and widened 2006.</p> <p>Recent dry-docking 12/21</p> <p>Recently installed [REDACTED] bow thruster</p>	<p>3-5 years</p> <p>(41 years oil)</p>	<p>Issues noted are cement ballast tanks, and vessel age which affect vessels useful life.</p> <p>Dependent upon mid-life and ME overhaul useful life may be extended through a rigorous maintenance program and focus.</p> <p>Well preserved for her age.</p> <p>Vessel's age, having to back freight trucks aboard for transport and some of her machinery make this vessel obsolete and at or near extent of useful life.</p>
8) M/V NANTUCKET	1974	<p>Mid Life completed 2008</p> <p>Recent dry-docking 03/2022</p>	<p>5-7 years</p> <p>(48 years old)</p>	<p>Issues noted are freight deck deterioration, age, deferred refit. and freight deck door challenges detract from useful life.</p> <p>It is likely to need a repower sometime in the near future.</p>
9) M/V MARTHA'S VINEYARD	1993	<p>Recently has completed an extensive mid-life dry docking (2018).</p> <p>Recent dry-docking 10/21/2021</p>	<p>18-20 years</p> <p>(29 years old)</p>	<p>Issues remaining post recent Mid-Life re-fit are crew training to recent technology recently fitted aboard and her age.</p>
10) M/V WOODS HOLE	2016	<p>New vessel that will not be looking for her midlife until mid-2030's</p> <p>Recent dry-docking 02/17/2021</p>	<p>40 plus years</p> <p>With mid-life at 20 to 25years</p> <p>(6 years old)</p>	<p>Newest vessel to the fleet, recently plagued by a series of issues most of which may be controlled by crew training to recent technology, vessel systems & SSA protocols and policies.</p>

4 OBSERVATION SURVEY REPORTS

M/V EAGLE



OFFICIAL NO. : 910026
IMO NO. : 8705864
CALL SIGN : WCX-5125
OWNER : Woods Hole, Martha's Vineyard, & Nantucket Steamship Authority
TYPE : Subchapter H - Passenger/vehicle vessel.
LOA : 233'
LBP : 218.7'
BREADTH : 61' 6"
DRAFT : 12'2"
DEPTH : 16'
GROSS TONS : 397 GRT (3269 ITC)
NET TONS : 270 NRT (1389 ITC)
DWT : 522 T
DISP. : 1,411 T
SPEED : 15 Kts
PERSONS : 818
BUILT : 1987, Amelia Louisiana. McDermott Shipyard

Next Dry Dock & Internal Structure Exam : 12/31/2022
Last Exam : 12/31/2020

THIS IS TO CERTIFY THAT on 06 December 2021, the attending surveyor did conduct a walk-through survey of the above captioned vessel while afloat and alongside SSA Fairhaven Repair Facility located in Fairhaven, MA.

This survey was conducted at the request of Steamship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

This survey was conducted in the company of the Master, Chief Engineer and partially with a SSA's Project Engineer.

Additionally, the voids were surveyed and photographed while the vessel was afloat and moored at the SSA Fairhaven Repair Facility on 07 December 2021.

VESSEL DESCRIPTION

The M/V EAGLE is a 233 foot all welded steel passenger/vehicle/freight vessel. The vessel is arranged with an enclosed vehicle/freight deck on the main deck level with hydraulic bow and stern doors for loading. [REDACTED]

This vessel is regulated as a Passenger/Vehicle Ferry under 46 CFR Sub-Chapter H.

CONDITIONS FOUND

The vessel's overall condition indicates it is well maintained and appearance for public perception is good. Passenger areas were being cleaned and appeared that maintenance and upkeep while underway is consistent.

All navigation equipment was found in good working order. The steering system components were upgraded to an EMI Steering Control System in December 2018. A FMEA and DVTP were signed off on 01/08/2019. The captain indicated the system is working as designed.

MACHINERY

The vessel is powered by [REDACTED] diesel engines, rated at 1,500 HP, each coupled to a reverse/reduction gear [REDACTED].

Electrical power is provided by [REDACTED] diesel engines driving companion generator sets, each rated at 185 KW.

Monthly oil samples are taken of operating machinery and sent for analysis, with results utilized by the engineering management staff to gauge engine condition, alert them to immediate problems, and to schedule maintenance, such as oil changes.

USEFUL LIFE CHALLENGES

The M/V EAGLE, was constructed in 1987, and is thirty-four (35) years old. She is a heavily utilized passenger and freight vessel operating between Hyannis and Nantucket. This vessel is one of their workhorses, capable of operating in all seasons and weather. Between 2019 and 2021, the EAGLE made a total of 5,439 trips with only fifteen (15) trips cancelled due to mechanical issues.

The most notable challenge facing the MV EAGLE is her age. During the below deck inspection, even though framing is well maintained, there remains corrosion patterns in way of areas where standing water collects, which in-turn creates a loss of steel. Some framing is showing steel loss and thin edges. An issue also noted is the areas immediately adjacent to the flush deck hatches. Hull framing at the immediate top opening and the upper portion of the ladder exhibit steel deterioration. The Eagle operates in Nantucket Sound and open water for approximately 22n/m before arriving in a lee from adverse weather. However, the working of the vessel structures is evident when observing external and internal framing, both longitudinal and traverse.

Her main engines [REDACTED] are older generation machinery, which often creates time consuming difficulties in locating original equipment manufacturer's spare parts.

Being an older vessel, it may be challenging and cost ineffective to upgrade to newer technology, such as digital integration and autonomy.

[REDACTED]

Estimated useful life of the EAGLE at the time of survey, considering the route, continued maintenance, dry dock periods with possible plate replacement is estimated to be 12-14 years.

Cost to replace this vessel is estimated to be in the \$50M or higher range. A minimum of five years may be needed, from design concept stage to receipt of a replacement vessel.

M/V GAY HEAD



OFFICIAL NO. : 643770
IMO NO. : 8123418
CALL SIGN : WCX-5125
OWNER : Woods Hole, Martha's Vineyard, & Nantucket Steamship Authority
TYPE : Subchapter T & I Passenger Vessel / Freight Vessel
LOA : 235'
LBP : 217.9
BREADTH : 52'
DRAFT : 11' 2"
DEPTH : 14'
GROSS TONS : 99 GRT 1277 GT ITC
NET TONS : 73 NRT 383 NT ITC
DWT : 522 T
DISP. : 1,411 T
SPEED : 15 Kts
PERSONS : 140/16
BUILT : 1981 – Escatawpa, MS

Next Dry Dock & Internal Structure Exam : 08/30/2022
Last Exam : 08/2021

THIS IS TO CERTIFY THAT on 27 July 2021 the undersigned surveyor did attend and conduct a walk-through survey of the above captioned vessel while in dry dock at Thames Shipyard & Repair, New London, CT. This survey was conducted at the request of Steamship Authority management for the purpose of deciding the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

This survey was conducted in the company of Captain and Chief Engineer.

VESSEL DESCRIPTION/CERTIFICATION

The M/V GAY HEAD is a USCG certified freight and passenger vessel of all welded steel construction and is built to have a continuous main deck, with superstructure, passenger spaces

and crew accommodations forward. Initially designed as an offshore supply vessel (OSV) this vessel was converted to a freight and passenger vessel in 1987. She is designed with three decks and displacement hull. The GAY HEAD is regulated under both 46 CFR Sub Chapter T (Passenger/Vehicle Ferry) and Sub Chapter I (Cargo Vessel).

[REDACTED]

The Certificate of Inspection allows this vessel to carry 140 passengers and operates with seven (7) crew members on voyages from Hyannis to Nantucket Island, MA. However, it has the ability to operate on the Woods Hole to Vineyard Haven route per the issued COI. The vessel carries a letter of stability issued, October 5, 2011. While operating under subchapter I, the vessel is not permitted to transport hazardous unless the transportation is in accordance with 49 CFR Sub C (Parts 171-180), Hazardous Materials Regulations. When operating in the I condition no passengers are allowed to be onboard, however, a total of up to 16 Persons may be carried in addition to the crew to facilitate the safe handling of the vehicles. Additional firefighting equipment is required meeting 49 CFR 176.315 when transporting flammable or combustible liquids.

MACHINERY

[REDACTED]

[REDACTED] The M/V GAY HEAD is propelled by [REDACTED] marine engines, rated at approximately 1450 HP each, fitted with [REDACTED] reverse/reduction gears with a 3.039/1 ratio.

Electrical power is provided by two (2) 8 V-71 generator sets, producing 99 KW each. Electrical distribution panels appear in good condition with wiring adequately maintained.

Fitted below the main deck and forward is a well maintained but old 8 V-71 [REDACTED] Bow thruster engine. [REDACTED]

[REDACTED] The bow thruster is an older model [REDACTED] and will require replacement as spares are not available.

CONDITIONS FOUND

The MV GAY HEAD was found in overall acceptable condition, although in the dry-dock at the time of survey with evidence of an ongoing rigorous maintenance program. The surveyor was made aware, following our visit, that a section of hull plating on the starboard side was cropped

and replaced. The repair consisted of removal the concrete ballast, cropping of hull plate and replacing of same. Once completed, concrete ballast was then replaced.

USEFUL LIFE CHALLENGES

The age of this vessel requires added engineering oversight and maintenance to insure she remains available to SSA's client base of passengers and island-required supplies. Maintaining such a strict operating schedule between trips certainly affects her useful life as it does not allow for engineering shore support to address problems that may occur during operations.

The MV GAY HEAD was originally built in 1981, making her forty-one (41) years old. During modifications in 2005 an additional 50 feet of length was added to the vessel and the freight deck was widened to accommodate more vehicles and freight cargo. The conversion process created additional void compartments, sponson wing spaces and double bottoms. Although they are accessible, these spaces are difficult and labor-intensive to maintain.

Poured concrete ballast was used within her voids to provide draft and stability necessary to perform effectively as a freight and passenger vessel in all seasons and sea states.

The most significant challenge facing the MV GAY HEAD is her age. This, coupled with the fact that freight trucks must back onto this vessel, effectively makes this vessel functionally obsolete.

The MV GAY HEAD is involved with a CMMS, the extent of which should allow this vessel to operate for at least another 3-5 years, provided the present rigorous maintenance schedule is maintained.

The cost to replace this vessel is estimated to be in the \$30 million range. A minimum of five years is needed from the start of a design concept to delivery of a replacement vessel.

M/V GOVERNOR



OFFICIAL NO. : 267527
OWNER : Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
LOA : 242'
BREADTH : 65'
DEPTH : 17' ½"
GROSS TONNAGE : 678 GRT
NET TONNAGE : 352 NRT
BUILT : 1954, Oakland California
PROPULSION : Two [REDACTED] Main Engines [REDACTED]
TOTAL HP : 1529 HP each (3,058 HP total)

Next Dry Dock & Internal Structure Exam : 04/30/2023
Last Exam : 04/30/2021

THIS IS TO CERTIFY THAT on December 01, 2021, the undersigned attending surveyor did conduct a walk-through survey of the above captioned vessel while afloat and alongside the SSA Fairhaven Repair Facility located in Fairhaven, MA.

This survey was conducted at the request of Steamship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

This survey was conducted in the company of the vessel Master and Chief Engineer.

DESCRIPTION

The M/V GOVERNOR welded steel construction with flat freight/vehicle main deck with a passenger seating tunnel along the starboard side amidships. This vessel is fitted with a two deck centrally located superstructure amidships housing additional passenger sitting, vessel crew accommodations, operating offices, engine room companionways and two (2) pilot house navigation platforms atop, fore and aft.



██ Loading or disembarking is accomplished from either the bow or stern, allowing for drive on-drive off.

Initially designed for West Coast operations, she now operates from May to October from Woods Hole to Martha's Vineyard primarily as a freight/vehicle carrier. Operating parameters are closely adhered to as the double-end configuration does not allow for protection from seas breaking over the bow(s). She is designed to operate with an approximate twelve (12') draft dependent upon her load. Consequently, she can only operate on the Martha's Vineyard service.

The main deck is so constructed with a fully enclosed passenger seating tunnel fitted to the outboard, starboard side and entered fore and aft by weathertight doors. Fitted to the port forward bow is a ridged hull, emergency rescue boat with an outboard engine. Two inflatable life rafts are mounted forward and aft at opposing sides. This vessel is fitted with bow and stern gates that swing outboard, allowing for crew/passenger safety and the loading and discharge of vehicles, freight, and passengers.

The superstructure is fitted centrally and amidships. The 01 level accommodates additional passenger seating and a crew galley with dining table. [REDACTED]

_____ Watertight doors facing inboard protect the space from any water shipped on deck.

MACHINERY AND MACHINERY SPACES

Main propulsion machinery is by two [REDACTED] main engines, [REDACTED], installed in 2011. Each engine delivers 1529 hp (1140KW) at 1600 RPM each.

Three (3) [REDACTED] generators, installed in 2018 able to produce 135 kW each.

A [REDACTED] emergency generator is fitted on the upper deck, rated at 55KW: 460V AC.

CONDITIONS FOUND

The coatings systems were found in satisfactory condition. Mechanical and electronic equipment appear well maintained, however of older vintage. The forward and after void bilges were found acceptable, and two voids were found with heavier rust: specifically, the forward and aft shaft void.

The vessel is in compliance with US Coast Guard requirements as a passenger vessel within the limits of the Certificate of Inspection, and in our opinion is suitable for its intended service as a passenger vessel/freight vessel with the restriction of operating only on the Woods Hole to Martha's Vineyard route.

USEFUL LIFE CHALLENGES

The MV GOVERNOR is the oldest vessel in the fleet at 68 years of age. The GOVERNOR was designed to operate in protected waters. The route between Woods Hole and Martha's Vineyard from fall to spring is capable of kicking up seas that at times prevent the GOVERNOR from safely transporting freight, vehicles, and passengers. She reportedly has a four to six-foot (4' - 6') sea limit, depending on tides and wind conditions. Her operational draft also limits her ability to operate in shallow bays and channels. Her functional obsolescence is accelerated by operation and age challenges.

Affecting the vessel's useful life is the difficulty to maintain hard to get to bilge areas within the deep sections and unattended voids, where heavy rust was found. These areas inherently have standing water for prolonged periods. These voids are difficult and labor intensive to maintain.

This vessel was originally designed as a diesel electric propelled vessel until 2011, when it was converted to all diesel power. Three new generators have been installed to accommodate electrical requirements. The third generator adds the ability to continue service with the USCG requirement of two operations units in the event one unit is down for maintenance or repair.

Steering is provided via hydraulically assisted quadrant rudder linked by large chains to heavy cable and hydraulic rams. The quadrant is fitted externally and subject to weather. The antiquated (although functioning) chain and sheave arrangements remain robust and appeared in good condition. However, they are functionally obsolete and require re-fit. This may include rudder replacements on either end to accommodate the re-fit.

From a general examination of this vessel afloat as far as practical, however not witnessing systems in operation, it is the opinion of the undersigned surveyor, that this vessel is in good condition for the service she is providing.

Estimated useful life of the GOVERNOR at the time of survey, considering the route, continued maintenance and required dry dock periods is 5-7 years.

Cost to replace this vessel is estimated to be in the \$25 – 30m range. A minimum of five (5) years may be needed from the start of concept design to receipt of a replacement.

M/V ISLAND HOME



OFFICIAL NO. : 1188126
IMO NO. : 9410478
OWNER : Woods Hole, Martha's Vineyard, & Nantucket Steamship Authority
TYPE : Passenger/vehicle vessel.
BUILT : 2007,
LOA : 254' 8"
LBP : 235' 2"
BREADTH : 64'
DEPTH : 17'
DRAFT : 10' 6"
GROSS TONS : 1,567 GRT 4,311 ITC
NET TONS : 1,066 NRT 1,298 ITC
SPEED : 16 KTS
BUILT : 2007/VT Halter Marine-Pascagoula, MS

Next Dry Dock & Internal Structure Exam : 02/25/2024
Last Exam : 02/25/2022

THIS IS TO CERTIFY THAT on November 05, 2021, the undersigned surveyor did attend and conduct a walk-through survey of the above captioned vessel while on a round trip transit between Woods Hole and the island of Martha's Vineyard, MA.

This survey was conducted at the request of Steam Ship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

This survey was conducted in the company of the vessel Captain, and relief Chief Engineer. I was also accompanied by the vessel's Pilot/Mate during the course of this survey.

VESSEL DESCRIPTION

The M/V ISLAND HOME is a 254.8 foot all welded steel hulled passenger/vehicle/freight vessel with an aluminum superstructure.

This vessel is regulated as a Passenger/Vehicle Ferry under 46 CFR Sub-Chapter H.

[REDACTED]

The freight and vehicle deck are designed and fitted with two (2) storable hydraulic lift decks to increase vehicle capacity. There is restriction for truck capacity when the lift decks are utilized, however vehicle type allocations are in place to mitigate any issues. Egress and access for passengers is from the 01 mezzanine deck, port and starboard by and inter-locking fire screen door system that does not allow access when the lift decks are not in operation.

Fitted with two main passenger decks (02 and 03 levels) with additional passenger capacity on the 03 deck, this vessel has the capacity to carry 1,210 passengers and 76 vehicles.

[REDACTED]

CONDITIONS FOUND

The ISLAND HOME is a relatively young vessel at 15 years old. The surveyor found this vessel to be in good condition, with evidence of consistent cleaning while in service and an ongoing maintenance program.

This vessel's route is between Woods Hole and Martha's Vineyard. Due to her size, it is recommended it not to operate on the Hyannis to Nantucket route.

Our survey found this vessel to be well maintained, however, beginning to show signs of wear in high traffic areas and a sampling of various spaces not normally inspected. Areas such as these can become problematic if regular inspections are not implemented.

Safety gear surveyed was found up to date and well maintained, along with a well kept bridge. The engineering spaces were found in good order, well lit and clean.

Within the concession and food service areas and in way of where re-fits of utility equipment have been done, deck covering had been cut away allowing water ingress under covering and showing corrosion patterns. Also, in the same area a cleaning gear locker requires attention for extensive rust accumulation in way of joiner work that is migrating to adjacent areas.

Internal inspections of both steering gear rooms and voids were also conducted. As with other vessels in the fleet, there is an inherent problem with the flush mounted deck hatches. Large trucks and vehicles travel over these hatches on a regular basis. Although the hatches are required to be

[REDACTED]

accessible, the constant traffic traversing across them, degrading the gasket, allows for water on deck during rainy/snowy periods and or rough weather to migrate under the hatch, entering the void space(s). With the water, accumulated dirt/sand makes its way between the hatch and gasket thus creating a constant maintenance issue. It is recommended these hatches be an item for a PM on a regular basis.

MACHINERY

Propulsion is provided by a pair of [REDACTED] main engines with a single shaft running fore and aft. SSA is active, in that shoreside engineering maintains like type/engines for their systems allowing for efficient parts control and repair systems.

Bow and stern thrusters are [REDACTED] fitted one on either end. The A/C prime movers were replaced with [REDACTED] diesel engines in 2018.

Generators are three [REDACTED] generators along with one (1) [REDACTED] emergency generator system located on the upper deck.

[REDACTED]
[REDACTED]
[REDACTED]

USEFUL LIFE CHALLENGES

The double ended ISLAND HOME is one the SSA's more junior vessels. This is a well-designed and heavily build vessel. She is one of the larger vessels in the fleet. This vessel is fitted with Americans with Disabilities Act (ADA) features and is well tested and engineered for sea keeping stability.

Fitted with the latest technology in 2007 allows for easier upgrading of computer systems in the future.

The ISLAND HOME is one of the workhorses on the Woods Hole, Vineyard route. Challenges facing this vessel's useful life will be her lift deck arrangement, the heavy vehicle and truck traffic across the freight deck and passenger wear and tear on those areas. The ISLAND HOME passenger capacity is over 1,200. With +/- 4,396 scheduled trips per year it is evident of the need for extended maintenance periods and longer shipyard durations to enhance the useful life.

Estimated useful life of the ISLAND HOME at the time of survey, considering the route, continued maintenance, dry dock periods with possible plate replacement is 30-33 years.

Cost to replace this vessel is estimated to be in the \$60 million range. A minimum of five years is needed from design concept to receipt of a replacement.

M/V IYANOUGH



OFFICIAL NO.	: 1185366
OWNER	: Woods Hole, Martha's Vineyard, & Nantucket Steamship Authority
TYPE	: Passenger, Inspected.
LOA	: 154.2' (47 m)
Length WL	: 144.5' (44.04 m)
LBP	: 103' (31.39 m)
BREADTH	: 39.9' (12.162 m)
DRAFT	: 4'7" (4' FWD-6' AFT)
DEPTH	: 12.6' (
GROSS TONS	: 98 GRT (563 ITC)
NET TONS	: 66 NRT (186 ITC)
BUILT	: 2006/ Gladding-Hearn Shipbuilding of Somerset, MA.
CREW	: 7
PASSENGERS	: 393
SPEED	: 35 knots

Next Dry Dock & Internal Structure Exam	: February 2024
Last Exam	: February 2022

THIS IS TO CERTIFY THAT on December 13, 2021, the undersigned surveyor did attend and conduct a walk-through survey of the above captioned vessel while docked in Hyannis, MA at the Steamship Authority's Hyannis Terminal.

This survey was conducted at the request of Steamship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

This survey was conducted in the company of Chief Engineer and later joined by the vessel Master.

VESSEL DESCRIPTION

The M/V IYANOUGH is a 154.2 foot all welded aluminum high speed dual hulled (catamaran) passenger vessel of all welded aluminum construction to an Incat Crowther design.

This vessel is twin hulled, with the superstructure constructed as a self-contained unit and supported on resilient mounts for isolation of machinery noise and vibration. The vessel conforms to the high-speed craft code as adopted by the United States Coast Guard. The pontoons are of the specially developed high-speed type, featuring the single hard chine form.

[REDACTED]

The main deck level includes a large service bar, toilet facilities, boarding ramp, luggage compartment and interior passenger seating.

The 01 deck consists of the pilothouse forward, followed by interior passenger seating, toilet facilities, with exterior passenger seating aft.

[REDACTED]

CONDITIONS FOUND

From a general examination of this vessel afloat as far as practical without making removals to expose parts concealed at the time of survey, not witnessing systems in operation, it is the opinion of the undersigned surveyor that this vessel is in satisfactory condition for a vessel of this age and style, sailing under an approved COI and a strict maintenance system managed by the engineering department.

Side shell plating, port and starboard above the waterline and in way of exhaust discharges aft has been repaired/replaced over time. The heat from the main engine exhausting into the pontoons is partially to blame, however operating in the colder months with excessive salt spray and the temperature differential certainly intensifies the degradation of the aluminum plating.

As this vessel gets older, the amount of focus and energy required by the shore support engineering staff escalates exponentially.

MACHINERY

This speedy catamaran is powered by four [REDACTED] engines, two (2) per side, offering total a combined 9,400HP.

These engines are providing power for four [REDACTED] water jets.

Providing electrical power to this vessel are two [REDACTED] generators with an individual capacity of 175 KW, 210 V 3 pH being driven by two (2) [REDACTED] prime movers. Port side rebuilt in 2019 with the starboard side in 2020.

A ride control system is provided aboard by two [REDACTED] motion sensor devices.

USEFUL LIFE CHALLENGES

The M/V IYANOUGH averaged over 2,400 runs per year from Hyannis to Nantucket carrying up to 400 passengers each way between 2019 - 2020.

With every year this vessel operates, the level of attention required increases. Extra focus will be required by engineering support. Reviewing the number of days this vessel has a cancelled trip due to mechanical failure from 2019 through 2021 shows an increase in the number of days as the vessel gets older.

Challenges facing this vessel's useful life are her age, operating at high engine RPM's, vessel route and available down time for PM and regular upkeep. Records indicate that the maintenance costs escalate each year, especially from mid-life forward.

Life expectancy for aluminum vessel is estimated to be about twenty (20) years, (*Marine Frontiers Pvt. Ltd. 16 MCH 2017*). However, there are companies that estimate aluminum vessels have a 30-year life expectancy (<http://www.onexcompany.com/okyalos/>).

It is safe to say that the useful life for any aluminum vessel is entirely dependent upon sea state, level of usage, maintenance management program and ability to manage escalating maintenance costs.

Estimated useful life of the IYANOUGH at the time of survey, considering the route, continued maintenance, dry dock periods with possible side plate replacement is 22-25 years.

Cost to replace this vessel is estimated to be in the \$20 million range. A minimum of 3 years is needed from design concept to receipt of a replacement vessel.

M/V KATAMA



OFFICIAL NO. : 653266
OWNER : Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
LOA : 235'
REG. LENGTH : 215.8'
BREADTH : 52'
DEPTH : 14.3'
DESIGN DRAFT : 10'6"
GROSS TONS : 99 GRT ITC-1247
NET TONS : 67 NRT ITC-374
FUEL (2) : 9,862 US GALLONS
PROPULSION : (2) [REDACTED] Main Engines 1,450 HP each
BUILT : 1982. Scully Brothers Shipyard, Stephenville, LA.

Next Dry Dock & Internal Structure Exam : August 31, 2022

Last Exam : August 27, 2020

THIS IS TO CERTIFY THAT on November 05, 2021, the undersigned surveyor did attend and conduct a walk-through survey of the above captioned vessel while on a round trip transit between Woods Hole and the island of Martha's Vineyard, MA.

This survey was conducted at the request of Steamship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

This survey was conducted in the company of the vessel Captain, Pilot, Chief Engineer, and various crew members.

VESSEL DESCRIPTION

The MV KATAMA, formerly the M/V PRO NAVIGATOR, was originally constructed in 1982, by Scully Brothers Shipyard, LA. Initially designed as an offshore supply vessel (OSV), the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority contracted with McDermott Shipyard to have her converted to a vehicle/freight and passenger vessel in 1986.

The vessel is regulated under both 46 CFR Sub Chapter T (Passenger/Vehicle Ferry) and Sub Chapter I (Cargo Vessel). The Certificate of Inspection allows this vessel to carry 140 passengers and operates with seven (7) crew members on voyages from Hyannis to Nantucket and also

operates on the Woods Hole to Vineyard Haven route when required. While operating under subchapter I, the vessel is not permitted to transport hazardous unless the transportation is in accordance with 49 CFR Sub C (Parts 171-180), Hazardous Materials Regulations. Certain restrictions apply when operating in the I condition. One of which is no passengers are allowed to be onboard, however, a total of up to 16 persons may be carried in addition to the crew to facilitate the safe handling of the vehicles. Additional firefighting equipment is required meeting 49 CFR 176.315 when transporting flammable or combustible liquids.

The MV KATAMA is constructed of welded steel and is designed with a displacement hull. Her main deck is continuous with the superstructure constructed forward which includes 01 and 02 levels. The vessel is loaded over the stern which had been modified to fit ferry slip ramps. The main deck area is designed to accommodate freight and passenger vehicle cargo.

The 01 level is so constructed to accommodate passengers inside with seating on the afterdeck of the 01 and a walk around bow area. There are inflatable life rafts positioned on the 01 level, port and starboard. The 02 level contains the pilothouse, rescue boat and a launching davit.

Forward on the 01 level, the forecastle is equipped with an anchor windless. [REDACTED]
[REDACTED]
[REDACTED]

MACHINERY AND MACHINERY SPACES

Below the main deck the vessel is divided into six major watertight compartments, separated by steel main transverse watertight bulkheads.

Main propulsion machinery is by two (2) [REDACTED] diesel main engines providing a documented 1,525 HP each.

Two [REDACTED] generators are fitted within the engine room spaces able to produce 99 KW, 230V; 3 PH each.

This vessel is also fitted with an 8V-71 bow thruster engine which produces a documented 300 hp.

[REDACTED]. The engine is the prime mover for a [REDACTED] bow thruster to assist with maneuvering while docking and undocking.

CONDITIONS FOUND

From a general examination of this vessel while underway, the surveyor witnessed systems in operation, and all appeared normal. This vessel is in adequate condition for a vessel of this age and style, sailing under an approved COI and a strict maintenance system managed by engineering department.

The coating systems were found intact with slight rust staining in way of bulwark openings, hatch hinges and other difficult areas to get to. The mechanical and electronic equipment appear well

used and with well documented repairs and maintenance. In addition, during the conversion the access tunnel was removed from the original design which connected the bow thruster compartment forward to the engine room compartment aft. An additional 50 feet was added the vessel and widened to accommodate more vehicles and freight cargo. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

During survey, the surveyor found evidence of a continuous and necessary aggressive maintenance program. This vessel is approaching the extent her useful life. The surveyor found that there are compartments where her age is showing especially in hard to get to areas, [REDACTED]

[REDACTED]

USEFUL LIFE CHALLENGES

The fact that the KATAMA is 40 years old in itself affects this vessel's useful life. Taking her hull and equipment age and the fact that trucks must back onto this vessel into account, effectively makes this vessel obsolete. Evidence of her age can be seen in some of the rusted framework, bulkheads, unused voids, chain locker spaces and interior components. Her engineering plants although found in good mechanical order, are increasingly difficult to find and maintain parts for.

Working against the vessels useful life is not just her age, but the difficulty in gaining access to and maintain voids and double bottoms. These voids are difficult and labor intensive to maintain. In addition, the voids and wing spaces are in a constant damp state causing accelerated steel degradation. Concrete put into various voids although necessary for permanent ballast and stability reasons present significant maintenance challenges and as such affect lessens her useful life.

Multiple unscheduled dry dockings were conducted over the past couple years in order to repair or replace underwater shell plating and longitudinal frames within the machinery spaces. Watertight bulkheads were also cropped and renewed as part of these dry dockings.

The KATAMA is involved with a strong maintenance management system (MMS), the extent of which should allow this vessel to operate for at least another 3-5 years, provided their present rigorous maintenance schedule is maintained.

Cost to replace this vessel is estimated to be in the \$20M or higher. A minimum of three to five years is required from concept design to receipt of a replacement vessel should be considered.

M/V SANKATY



OFFICIAL NO.	: 640565
OWNER	: Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
LOA	: 235'
BREADTH	: 52'
DEPTH	: 14'
DESIGN DRAFT	: 9' 9"
GROSS TONS	: 749 GRT 1,315 ITC
NET TONS	: 550 NRT 394 ITC
BUILT	: 1981 by Rysco Blountstown, FL. Refitted Jean Lafitte, AL 1994
PASSENGERS	: 292
CREW	: 7

Next Dry Dock & Internal Structure Exam	: December 21, 2023
Last Exam	: January 13, 2021

THIS IS TO CERTIFY THAT on September 28, 2021, the attending surveyor did conduct a walk-through survey of the above captioned vessel while afloat and alongside SSA Fairhaven Repair Facility located in Fairhaven, MA. This survey was conducted and in the company of an SSA Port Engineer.

This survey was conducted at the request of Steamship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

VESSEL DESCRIPTION

The SANKATY, originally constructed in 1981, Blountstown, FL., is of the later vintage at 41 years old. It was initially designed as an offshore supply vessel (OSV) built with a Gulf of Mexico methodology and expected useful life of 25 years. The Woods Hole, Martha's Vineyard and Nantucket Steamship Authority (SSA) had her converted to a freight/vehicle, passenger vessel in 1994 and she was lengthened and widened in 2006 to 235' to accommodate additional cars and trucks.

The vessel is regulated under both 46 CFR Sub Chapter H (Passenger/Vehicle Ferry) and Sub Chapter I (Cargo Vessel). The Certificate of Inspection allows this vessel to carry 290 passengers and operates with seven (7) crew members on voyages from Hyannis to Nantucket and also operates on the Woods Hole to Vineyard Haven route when required. While operating under subchapter I, the vessel is not permitted to transport hazardous unless the transportation is in accordance with 49 CFR Sub C (Parts 171-180), Hazardous Materials Regulations. Certain restrictions apply when operating in the I condition. One of which is no passengers are allowed to be onboard, however, a total of up to 25 persons may be carried in addition to the crew to facilitate the safe handling of the vehicles. Additional firefighting equipment is required meeting 49 CFR 176.315 when transporting flammable or combustible liquids.

The SANKATY is constructed of steel and is designed with a displacement hull. Her main deck is continuous with the superstructure constructed forward which includes 01 and 02 levels. The vessel is loaded over the stern which is been modified to fit the ferry slip ramps.

The main deck is designed for carrying cars and trucks, with the forward main deck within the superstructure designed to accommodate passengers and contains crewmember accommodations and a galley.

Access to the main deck passenger and [REDACTED] is by means of a weathertight door on the main deck. Access is fitted with an ADA compliant ramp. The space is arranged with small passenger lounge to starboard and crew's accommodations forward and to port. An internal companionway leads to the forecandle deck interior passenger accommodations which are fitted with aircraft style seating.

Additional means of access to the passenger compartment on the 01-level deck is through weathertight doors both port and starboard on the after bulkhead and a weathertight door on the forward bulkhead to access the bow area. [REDACTED]

[REDACTED] There is an additional passenger area on the 03 level that is utilized when the passenger count is at maximum.

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

MACHINERY AND MACHINERY SPACES

Main propulsion machinery is by two [REDACTED] diesel main engines, providing a reported 1,150 HP each. The engines were not in operation at the time of the survey, however appeared to be well maintained.

Two [REDACTED] generators are fitted within the engine room spaces able to produce 135 KW; 460V; 3PH each and one [REDACTED] emergency generator fitted within the 01-deck aft end of the superstructure.

This vessel was fitted [REDACTED] bow thruster in January of 2020. [REDACTED]
[REDACTED]
[REDACTED]

CONDITIONS FOUND

From a general examination of this vessel afloat as far as practical without making removals to expose parts concealed at the time of survey, it is the opinion of the undersigned surveyor that this vessel is in a serviceable condition.

The coating systems was found in good condition, mechanical and electronic equipment appear well maintained. Upon her conversion in 2006, the vessel had concrete added to several of her void tanks for trim and stability to safely operate as a freight, vehicle, and passenger vessel.

Throughout the voids an elevated level of attention and maintenance is apparent including the control of moisture. The bilges are as well maintained as possible and for the most part dry and well coated.

The vessel is in compliance with US Coast Guard requirements as a passenger and freight vessel within the limits of the Certificate of Inspection. The SANKATY, in the opinion of the surveyor, is suitable for its intended service as a freight and passenger vessel on the route permitted by the COI.

USEFUL LIFE CHALLENGES

The M/V SANKATY is 41 years old. Her advanced age strongly affects this vessel's useful life. The level of maintenance required increases proportionally with a vessels age. Evidence of her age can be seen in some of the rusted framework, bulkheads, unused voids, and chain locker.

Poured cement ballast into voids will present maintenance challenges and as such affects her useful life [REDACTED]. Another issue concealing hidden corrosion patterns are the heavy non-skid coatings on the deck surfaces. Although it provides additional traction for vehicles and safe walkways for passengers, it does become problematic as the vessel ages.

The [REDACTED] main engines are an older model and as such securing parts becomes a challenge.

The SANKATY, is party to a CMMS, the extent of which should allow this vessel to operate for at least another 3-5 years, provided their present rigorous maintenance schedule is maintained.

Cost to replace this vessel is estimated to be in the \$25 million range. A minimum of four is required from concept design to receipt of a replacement vessel.

M/V NANTUCKET



OFFICIAL NO. : 556196
IMO NO. : 7334199
MMSI number : 367324580
OWNER : Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
LOA : 230' (70.1M)
LBP : 216.6' (66.01M)
BREADTH : 60'-3" (18.36M)
DEPTH : 17' (5.18M)
DESIGNED DRAFT : 10'-9" (3.28M)
GROSS TONS : 1148 GRT 2,532 ITC
NET TONS : 781 NRT 1,108 ITC
PROPULSION : Twin [REDACTED] engines rated at 1,500 HP each totaling 3000HP
BUILT : 1974 Jacksonville Florida
SPEED : 15 KTS (Maximum)
PASSENGERS : 752
CREW : 16

Next Dry Dock & Internal Structure Exam : May 21, 2023
Last Exam : May 08, 2020

THIS IS TO CERTIFY THAT the undersigned surveyor on November 30, 2021, did attend and conduct a walk-through survey of the above captioned vessel while afloat and alongside SSA Fairhaven Repair Facility located in Fairhaven, MA. The survey was conducted and in the company of vessel Captain, Chief Engineer and repair crew assigned.

This survey was conducted at the request of Steamship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

VESSEL DESCRIPTION

The vessel was constructed in 1974, in Jacksonville Florida., for the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority.

This vessel is regulated as a Passenger/Vehicle Ferry under 46 CFR Sub-Chapter H.

She is constructed of steel and is designed with a displacement hull and is designed as a passenger and vehicle ferry. The vessel operates primarily on the Hyannis to Nantucket ferry route. She is powered by two [REDACTED] engines rated at 1500 hp each.

The vessel is arranged within enclosed vehicle deck on the main deck level with hydraulic bow and Stern doors for passenger and vehicle loading. The Mezzanine deck or 01 level superstructure spans the vessel deck and provides for enclosed passenger lounge tunnels on both the port and starboard sides. The 02 level or boat deck provides a concession area, passenger cabin and open spaces surrounding the passenger concession space. The vessel underwent a mid-life refit during the off season of 2008 at Colonna's Shipyard, Norfolk VA. During this refit, renovations were made to passenger deck house which included a larger concession and dining area, the navigation platform was improved and updated. In addition, modifications are made to the mezzanine and 02 level passenger areas that allow for more efficient passenger evacuation. Additional modifications were made to the engine room ventilation system, the HVAC system, and freight deck structure modifications to assist with vehicle loading.

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

MACHINERY AND MACHINERY SPACES

Main propulsion machinery is by two [REDACTED] diesel main engines, providing a reported 1,500 HP each. Both main engines were installed in 1988 and were manufactured by [REDACTED]. Both engines are fitted with [REDACTED] reduction gears.

Two [REDACTED] generators are fitted within the engine room spaces able to produce 185KW 230V: 3PH each. Engineering staff reported that these engines typically operate at roughly 150KW.

This vessel is also fitted with a [REDACTED] mover for a [REDACTED] bow thruster. The bow thruster engine is located immediately below the main deck forward.

A [REDACTED] emergency generator located on the after and of the 02 level is capable of providing emergency power of 175 KW: 230V 3PH.

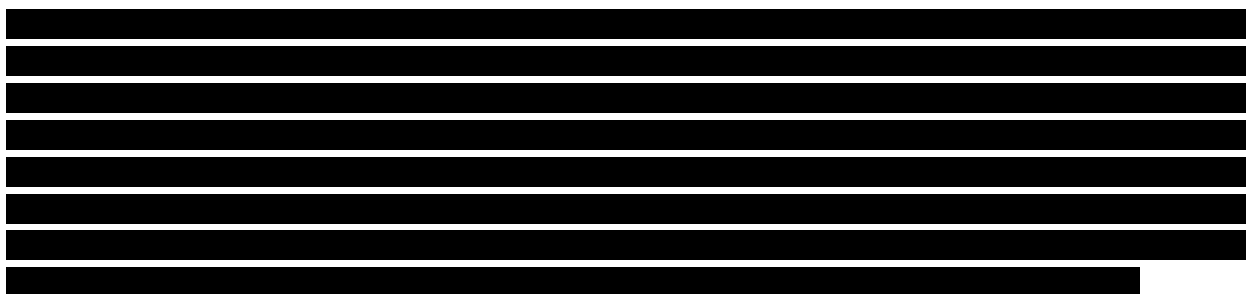
CONDITIONS FOUND

From a general examination of this vessel and not witnessing systems in operation, it is the opinion of the undersigned surveyor, that this vessel is in acceptable operating condition routes intended.

The weather deck coating systems are intact with adequate non-skid protection, however notwithstanding the deteriorating conditions of the deck plating. The freight deck has been replated in needed areas. It is noted that the next yard period will address the same issue. Areas have been recoated, although the degree of visible pitting and corrosion patterns creates a decrease in deck plate strength.

USEFUL LIFE CHALLENGES

The M/V NANTUCKET is 48 years old. Her advanced age clearly affects this vessel's useful life. The continued level of expensive maintenance methodologies required, increases proportionally with a vessels age. Evidence of her age can be seen on the main freight deck and plating on her upper deck. The rigorous & intense maintenance oversight helps extend her useful life, but her age is defining her continual functional obsolescence. See above reference to the PVA/USCG QP in regard to NVIC 7-68.



Her main engines and generators are well maintained. However, as engine hours increase and PMs are undertaken, the more difficult it becomes to locate, procure and retain parts to the degree necessary to meet the needs of the SSA mission. Adhering to EPA emission control regulations will continue to be a challenge as the vessel's systems age.

Strict dry dock and wet berth repair schedules are being met, however with a vessel sailing into her forty-eighth (48th) year, the level of required management/oversight focus increases exponentially.

The NANTUCKET, adhering to a CMMS, the extent of which should allow this vessel to operate for at least another 5-7 years, provided the present rigorous maintenance schedule is maintained and replacement hull and deck plating occurs during regular required dry dock periods.

Cost to replace this vessel is estimated to be in the \$60 million range. A minimum of four years is required from concept design to receipt of a replacement vessel.

M/V MARTHA's VINEYARD



VESSEL ON. : 997221 (*Official Number (U.S.)*)
USCG NO : CG395385
IMO : 9103881
OWNER : Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
LBP : 216.50 ft.
LOA : 230'
LBP : 224,1'
BEAM : 60'
DEPTH : 18'
DRAFT : 10'6.5"
Build Year : 1993, Atlantic Marine, Inc., Jacksonville Florida
GROSS TONS : 1,297 GRT 2,690 ITC
NET TONS : 882 NRT 1,215 ITC
Disp. (lightship) : 1142.47 LT
PROPULSION : 3000, Two (2) [REDACTED] rated at 1500 HP each.
CLASSIFICATION : 46 CFR Subchapter "H" Lakes, Bays, & Sounds, Partially Protected Waters, Cold Water Service
SPEED : 15 knots fully loaded
Vehicle Capacity : Approximately 54 cars or mix of trucks and cars
PASSENGERS : 1,000
CREW : 10
Last Dry Docked : JAN 2018 Mid-life overhaul

Next Dry Dock & Internal Structure Exam : October 31, 2023
Last Exam : October 30, 2021

THIS IS TO CERTIFY THAT the undersigned surveyor did, on December 13, 2021, attend and conduct a walk-through survey of the above captioned vessel while on a round trip transit between Woods Hole and the island of Martha's Vineyard, MA.

This survey was conducted at the request of Steamship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

This survey was conducted in the company of the vessel Captain, Pilot and various crew members.

VESSEL DESCRIPTION

The MV MARTHA'S VINEYARD, was constructed in 1993, Jacksonville Florida., for the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority (SSA).

Constructed of all welded steel and displacement hull, this vessel is designed as a passenger and vehicle ferry, operating primarily on the Woods Hole to Martha's Vineyard, MA ferry route. She is powered by two [REDACTED] engines rated at 1500 hp each.

The vessel is so arranged with an enclosed vehicle main deck with hydraulic bow and Stern doors for passenger, freight and vehicle loading. The Mezzanine deck or 01 level superstructure spans the vessel deck providing for enclosed passenger lounge tunnels on both the port and starboard sides. The 02 level or boat deck provides a concession area, passenger cabin and open spaces fore and aft of the passenger concession space. [REDACTED]

[REDACTED] Additional outdoor seating is available to accommodate passengers during the busy season immediately aft of the pilothouse superstructure.

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED]
[REDACTED]

MACHINERY AND MACHINERY SPACES

Main propulsion machinery is by two [REDACTED] diesel main engines, providing a reported 1,500 HP each for a total of 3,000 HP. Each engine is fitted with 1993 built [REDACTED] reduction gears with a ratio of 3.0:1. Each were removed, inspection and overhauled during 2017-2018 mid-life. (243)

Three [REDACTED] Diesel Generators [REDACTED] were installed as part of the mid-life overhaul. Two ([REDACTED] gen sets were installed in place of the removed units and installed an additional third [REDACTED] within Aux Machinery Room. This system is being employed by SSA engineering management to ensure that any two generators can run paralleled at one time. [REDACTED]
[REDACTED]

This vessel is fitted with a prime mover, [REDACTED] for an [REDACTED] bow thruster [REDACTED]. The bow thruster engine is [REDACTED] providing 385 HP of thrust.

A [REDACTED] emergency generator was located [REDACTED] on the 02 level, capable of providing emergency power of 125 KW: 230V.

CONDITIONS FOUND

From a general examination of this vessel while underway as far as practical without making removals to expose parts concealed at the time of survey, it is the opinion of the undersigned surveyor that this vessel will be in acceptable condition.

A new fixed FM200 system was installed to replace the removed engineering spaces CO2 system.

The weather deck coating systems were found intact; however, the external passenger decks show a number of locations pitted and some deformations of the plates.

The vessel is in compliance with US Coast Guard requirements as a passenger and freight vessel within the limits of the Certificate of Inspection. The M/V MARTHA'S VINEYARD in our opinion is suitable for its intended service as a Freight and Passenger vessel on the intended route.

USEFUL LIFE CHALLENGES

The MARTHA'S VINEYARD is 29 years old and when initially built, the hull plating was not as robust as other vessels in the fleet. During the last dry dock period, there were a number of deck plates on the freight deck (port quarter) cropped out and replaced and it is said that the next yard period will see more of the freight deck plating cropped and renewed.

Difficult to get at areas have showed signs of fatigue, wastage, wear and tear. The recent midlife re-fit and a rigorous maintenance program will allow this vessel to operate for several more years.

The Useful Life challenge will be to stay on top of all aspects of the vessel and focus on critical areas during yard periods. In addition, challenges remain in keeping up with the speed of technology advancements necessary for management to monitor systems effectively and collectively.

The MARTHA'S VINEYARD, although adhering to a CMMS, the extent of which should allow this vessel to operate for at least another 18-20 years, provided the present rigorous maintenance schedule is maintained and replacement hull and deck plating occurs during regular required dry dock periods.

Cost to replace this vessel is estimated to be in the \$60 million range. A minimum of four years is required from concept design to receipt of a replacement vessel.

M/V WOODS HOLE



OFFICIAL NO. : 1263642
IMO NO. : 9792931
MMSI : 367691010
OWNER : Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
LBP : 224.50 ft. (68.42m)
LOA : 235' (71.63m)
BREADTH : 64.00 ft. (19.51m)
DEPTH : 18.50 ft. (5.64m)
DRAFT : 10,5' (3.2m)
TONNAGE : 3907 GT ITC
 : 1172 GRT
 : 1172 NT ITC
 : 562 NRT
PROPULSION : Two (2) [REDACTED] diesel engines, rated at
 1,999KW each.
BUILT : 2016, Conrad Shipyard, LLC, Morgan City, LA.
PASSENGERS : 445
CREW : 8
SPEED : 14 Kts

Next Dry Dock & Internal Structure Exam : January 31, 2023
Last Exam : February 17, 2021

THIS IS TO CERTIFY THAT the undersigned surveyor did, on 13 December 2021 attend and conduct a walk-through survey of the above captioned vessel while berthed in at the Steamship Authority's Hyannis Terminal.

This survey was conducted at the request of Steamship Authority management for the purpose of determining the vessel's remaining useful life and identifying when her functional obsolescence may be reached.

This survey was conducted in the company of Captain, Chief Engineer and crew assigned that watch.

VESSEL DESCRIPTION

The MV WOODS HOLE, was designed by the Elliott Bay Design Group of Seattle, Washington and constructed by Conrad Shipyard, LLC in Morgan City, Louisiana. Launched in 2016 and commissioned on 13 June 2016 for the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority (SSA).

The vessel is regulated under both 46 CFR Sub Chapter H (Passenger/Vehicle Ferry). The vessel is permitted to transport hazardous materials provided the transportation is in accordance with 49 CFR Sub C (Parts 171-180), Hazardous Materials Regulations. One of which is no passengers are allowed to be onboard, however, a total of up to 25 persons may be carried in addition to the crew to facilitate the safe handling of the vehicles. Additional firefighting equipment is required meeting 49 CFR 176.315 when transporting flammable or combustible liquids.

The MV Woods Hole is constructed of all steel and is designed with a displacement hull. She is designed as a passenger and vehicle ferry, serving both the Woods Hole to Martha's Vineyard 45-minute route as well as the Hyannis to Nantucket two hours and fifteen-minute route. She is powered by two [REDACTED] diesel engines rated at 1999 KW each.

The vessel is so arranged with a vehicle main deck with hydraulic bow door for passenger, freight and vehicle loading. The stern is open with a stainless-steel gate system for passenger safety. The 02-level superstructure spans the vessel deck providing for enclosed passenger lounge, food service area, rest rooms, first aid, family washroom and access stairwells to the lower cargo deck and the upper 03 deck. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MACHINERY AND MACHINERY SPACES

Main propulsion machinery is powered by two [REDACTED] diesel main engines, providing 2,681 HP (1999 KW) each.

Three (3) [REDACTED] generators are fitted in the engineroom, [REDACTED], providing 310kw each. A [REDACTED] emergency generator is fitted aboard capable of providing 200kw of emergency power.

This vessel is fitted with one [REDACTED] bow thruster with a [REDACTED] as the prime mover.

CONDITIONS FOUND

From a general examination of this vessel while docked and as far as practical without making removals to expose parts concealed at the time of survey, it is the opinion of the undersigned surveyor that this vessel was found in a near new condition.

The weather deck coating systems are intact with adequate nonskid protection. The mechanical and electronic equipment appear well maintained and are as reported by attending engineer, all in good operating condition.

The vessel is in compliance with US Coast Guard requirements as a passenger and freight vessel within the limits of the Certificate of Inspection. The M/V WOODS HOLE, in our opinion is suitable for its intended service as a Freight and Passenger vessel on the routes defined by the COI.

The engineroom appeared in good condition, was clean, and well-organized. Although not underway, the machinery was said to be in excellent operating condition and appeared in new condition survey. There were areas in way of (IWO) of the rub rail, as viewed from the deck plates in the engineroom, that the coatings have been compromised. These areas should be addressed so as not to allowed corrosion patterns to propagate. There was an area in the bilge, in way of (IWO) of the bow thruster prime mover at the transverse bulkhead forward where there is a heavy paint coating. The Chief explained the internal coating had been disturbed and the thought was the bow has been sniffing the bottom in Hyannis Harbor. See photo in appendices.

USEFUL LIFE CHALLENGES

The M/V WOODS HOLE is six (6) years old, fitted with state-of-the-art systems. Her useful life remains decades in the future with mid-life sometime in the mid 2030's.

The WOODS HOLE, adhering to a CMMS, should allow this vessel to operate for at least another 40+ years, provided the present rigorous maintenance schedule is maintained during regular required dry dock and spruce up periods.

Cost to replace this vessel is estimated to be in the \$60 million range. A minimum of five years is required from concept design to receipt of a replacement vessel.

DISCLAIMER

In accepting this report, it is understood that the survey was performed without warranties as to the condition, seaworthiness, or marketability of the vessels.

To the best of our knowledge and belief, the statements contained in this report are true and accurate.

The report, analysis, opinions and conclusions are limited only by limiting conditions and represents our personal unbiased professional analysis, opinion and conclusion. The undersigned has no present or prospective interest in any vessel that is the subject of this report and have no personal interest or bias with respect to any of the parties involved.

This report is based on examination of the vessel, and of those parts, spaces and equipment that could be sighted without removals or operation and is rendered without bias or prejudice. In accepting same, it is agreed that the extent of obligation of this surveyor, with respect thereto, is limited to furnishing a competent survey, and in the making of this report this surveyor is acting on behalf of the person or firm requesting same, and no liability shall attach to this surveyor for the accuracy, errors and/or omissions, therefore.

Photographs taken during the course of our surveys are maintained electronically and available upon request by SSA Management.

Naval architecture and marine engineering analysis as usually performed in the design stage of the vessel's construction were not part of this survey and typical subjects such as adequacy of stability and sea keeping were not within the scope of this survey.



Submitted without prejudice,
MARINE SAFETY CONSULTANTS, INC.

A handwritten signature in blue ink, appearing to read "D. Hostetler", written over a horizontal line.

Dean B. Hostetler
Sr Marine Surveyor, Consultant, NAMS-CMS, IMCA-AVI